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1 [A high-performance object-oriented memory](#)



Craig Hyatt

September 1993 **ACM SIGARCH Computer Architecture News**, Volume 21 Issue 4

Publisher: ACM Press

Full text available: pdf(919.75 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

The proposed design places a high-performance object memory in a portable peripheral that relieves the host CPU of the burden of object address translation and the constant management of live objects. This flexible approach is designed for the newest generation of high-performance workstations running 32-bit Smalltalk, Lisp, C++ and other COP (object oriented programming) environments. With a two-layer cache and 50ns DRAM object memory, the hardware is capable of accessing object data (including ...

**Keywords:** RISC, binary-buddy allocation, capability-based protection

2 [Wisconsin Architectural Research Tool Set](#)



Mark D. Hill, James R. Larus, Alvin R. Lebeck, Madhusudhan Talluri, David A. Wood

September 1993 **ACM SIGARCH Computer Architecture News**, Volume 21 Issue 4

Publisher: ACM Press

Full text available: pdf(1.16 MB) Additional Information: [full citation](#), [citations](#), [index terms](#)

3 [Technical session 7: multimedia systems: Implementation and evaluation of EXT3NS multimedia file system](#)



Baik-Song Ahn, Sung-Hoon Sohn, Chei-Yol Kim, Gyu-Il Cha, Yun-Cheol Baek, Sung-In Jung, Myung-Joon Kim

October 2004 **Proceedings of the 12th annual ACM international conference on Multimedia MULTIMEDIA '04**

Publisher: ACM Press

Full text available: pdf(524.49 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

The EXT3NS is a scalable file system designed to handle video streaming workload in large-scale on-demand streaming services. It is based on a special H/W device, called Network-Storage card (NS card), which aims at accelerating streaming operation by shortening the data path from storage device to network interface. The design objective

of EXT3NS is to minimize the delay and the delay variance of I/O request in the sequential workload on NS card. Metadata structure, file organization, metadata ...

**Keywords:** file system, multimedia, streaming, video server

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Relevance scale     

# 1 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research CASCON '97**

**Publisher:** IBM Press

Full text available:  pdf(4.21 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

## 2 Empirical performance evaluation of concurrency and coherency control protocols for database sharing systems

Erhard Rahm

June 1993 **ACM Transactions on Database Systems (TODS)**, Volume 18 Issue 2

**Publisher:** ACM Press

Full text available:  pdf(3.37 MB)

Database Sharing (DB-sharing) refers to a general approach for building a distributed high performance transaction system. The nodes of a DB-sharing system are locally coupled via a high-speed interconnect and share a common database at the disk level. This is also known as a "shared disk" approach. We compare database sharing with the database partitioning (shared nothing) approach and discuss the functional DBMS components that require new and coordinated solutions for DB-shar ...

**Keywords:** coherency control, concurrency control, database partitioning, database sharing, performance analysis, shared disk, shared nothing, trace-driven simulation

<sup>3</sup> A predicate-based caching scheme for client-server database architectures

Arthur M. Keller, Julie Basu

January 1996 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 5 Issue 1

**Publisher:** Springer-Verlag New York, Inc.

Full text available:  pdf(162.80 KB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

We propose a new client-side data-caching scheme for relational databases with a central server and multiple clients. Data are loaded into each client cache based on queries executed on the central database at the server. These queries are used to form predicates that describe the cache contents. A subsequent query at the client may be satisfied in its local cache if we can determine that the query result is entirely contained in the cache. This issue is called *cache completeness*. A separ ...

**Keywords:** Cache completeness, Cache currency, Caching, Multiple clients, Relational databases

4 Rover: a toolkit for mobile information access



A. D. Joseph, A. F. de Lespinasse, J. A. Tauber, D. K. Gifford, M. F. Kaashoek

December 1995 **ACM SIGOPS Operating Systems Review , Proceedings of the fifteenth ACM symposium on Operating systems principles SOSP '95**, Volume 29 Issue 5

**Publisher:** ACM Press

Full text available:  pdf(2.18 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)


5 Reservations for Conflict Avoidance in a Mobile Database System



Nuno Preguiça, J. Legatheaux Martins, Miguel Cunha, Henrique Domingos

May 2003 **Proceedings of the 1st international conference on Mobile systems, applications and services MobiSys '03**

**Publisher:** ACM Press

Full text available:  pdf(287.63 KB) Additional Information: [full citation](#)


6 Specification and implementation of exceptions in workflow management systems



Fabio Casati, Stefano Ceri, Stefano Paraboschi, Guiseppe Pozzi

September 1999 **ACM Transactions on Database Systems (TODS)**, Volume 24 Issue 3

**Publisher:** ACM Press

Full text available:  pdf(250.40 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Although workflow management systems are most applicable when an organization follows standard business processes and routines, any of these processes faces the need for handling exceptions, i.e., asynchronous and anomalous situations that fall outside the normal control flow. In this paper we concentrate upon anomalous situations that, although unusual, are part of the semantics of workflow applications, and should be specified and monitored coherently; in most real-life applica ...


**Keywords:** active rules, asynchronous events, exceptions, workflow management systems

7 The relational model for database management: version 2

E. F. Codd

January 1990 Book

**Publisher:** Addison-Wesley Longman Publishing Co., Inc.

Full text available:  pdf(28.61 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

**From the Preface (See Front Matter for full Preface)**

An important adjunct to precision is a sound theoretical foundation. The relational model is solidly based on two parts of mathematics: firstorder predicate logic and the theory of relations. This book, however, does not dwell on the theoretical foundations, but rather on all the features of the relational model that I now perceive as important for database users, and therefore for DBMS vendors. My perceptions result from 20 y ...

**8 A publish/subscribe CORBA persistent state service prototype**

C. Liebig, M. Cilia, M. Betz, A. Buchmann

April 2000 **IFIP/ACM International Conference on Distributed systems platforms  
Middleware '00****Publisher:** Springer-Verlag New York, Inc.Full text available:  pdf(283.92 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)

An important class of information dissemination applications requires 1:n communication and access to persistent datastores. CORBA's new Persistent State Service combined with messaging capabilities offer the possibility of efficiently realizing information brokers between data sources and CORBA clients. In this paper we present a prototype implementation of the PSS that exploits the reliable multicast capabilities of an existing middleware platform. This publish/subscribe architecture makes ...

**9 Charles W. Bachman interview: September 25-26, 2004; Tucson, Arizona**


Thomas Haigh

January 2006 **ACM Oral History interviews****Publisher:** ACM PressFull text available:  pdf(761.66 KB) Additional Information: [full citation](#), [abstract](#)

Charles W. Bachman reviews his career. Born during 1924 in Kansas, Bachman attended high school in East Lansing, Michigan before joining the Army Anti Aircraft Artillery Corp, with which he spent two years in the Southwest Pacific Theater, during World War II. After his discharge from the military, Bachman earned a B.Sc. in Mechanical Engineering in 1948, followed immediately by an M.Sc. in the same discipline, from the University of Pennsylvania. On graduation, he went to work for Do ...

**10 Transactional workflow paradigm: its application to mobile computing**


V. K. Murthy

February 1998 **Proceedings of the 1998 ACM symposium on Applied Computing SAC '98****Publisher:** ACM PressFull text available:  pdf(997.50 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

**Keywords:** agents, intention-action protocols, mobile transactions, serializability, workflow

**11 Optimistic replication**

Yasushi Saito, Marc Shapiro

March 2005 **ACM Computing Surveys (CSUR)**, Volume 37 Issue 1**Publisher:** ACM PressFull text available:  pdf(656.72 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Data replication is a key technology in distributed systems that enables higher availability and performance. This article surveys optimistic replication algorithms. They allow replica

contents to diverge in the short term to support concurrent work practices and tolerate failures in low-quality communication links. The importance of such techniques is increasing as collaboration through wide-area and mobile networks becomes popular. Optimistic replication deploys algorithms not seen in tradition ...

**Keywords:** Replication, disconnected operation, distributed systems, large scale systems, optimistic techniques

## 12 Deadlock detection in distributed database systems: a new algorithm and a comparative performance analysis

Natalija Krivokapić, Alfons Kemper, Ehud Gudes

October 1999 **The VLDB Journal — The International Journal on Very Large Data**

**Bases**, Volume 8 Issue 2

**Publisher:** Springer-Verlag New York, Inc.

Full text available:  pdf(289.96 KB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

This paper attempts a comprehensive study of deadlock detection in distributed database systems. First, the two predominant deadlock models in these systems and the four different distributed deadlock detection approaches are discussed. Afterwards, a new deadlock detection algorithm is presented. The algorithm is based on dynamically creating *deadlock detection agents* (DDAs), each being responsible for detecting deadlocks in one connected component of the global wait-for-graph (WFG). The ...

**Keywords:** Comparative performance analysis, Deadlock detection, Distributed database systems, Simulation study

## 13 An introduction to data warehousing: what are the implications for the network?

Katherine Jones

February 1998 **International Journal of Network Management**, Volume 8 Issue 1

**Publisher:** John Wiley & Sons, Inc.

Full text available:  pdf(145.35 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Data warehousing is an information systems environment, rather than a product. It has emerged as an essential business entity for sophisticated analysis of data. This article presents a clear overview of the implications of data warehousing for business. © 1998 John Wiley & Sons, Ltd.


## 14 Temporal Streaming of Shared Memory



Thomas F. Wenisch, Stephen Somogyi, Nikolaos Hardavellas, Jangwoo Kim, Anastassia Ailamaki, Babak Falsafi



May 2005 **ACM SIGARCH Computer Architecture News , Proceedings of the 32nd Annual International Symposium on Computer Architecture ISCA '05**, Volume 33 Issue 2

**Publisher:** IEEE Computer Society, ACM Press



Full text available:  pdf(206.25 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Coherent read misses in shared-memory multiprocessors account for a substantial fraction of execution time in many important scientific and commercial workloads. We propose Temporal Streaming, to eliminate coherent read misses by streaming data to a processor in advance of the corresponding memory accesses. Temporal streaming dynamically identifies address sequences to be streamed by exploiting two common phenomena in shared-memory access patterns: (1) temporal address correlation & groups of sh ...

## 15 Frangipani: a scalable distributed file system

-  Chandramohan A. Thekkath, Timothy Mann, Edward K. Lee  
October 1997 **ACM SIGOPS Operating Systems Review , Proceedings of the sixteenth ACM symposium on Operating systems principles SOSP '97**, Volume 31 Issue 5  
**Publisher:** ACM Press  
Full text available:  pdf(2.20 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



16 The KaffeOS Java runtime system

-  Godmar Back, Wilson C. Hsieh  
July 2005 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 27 Issue 4  
**Publisher:** ACM Press  
Full text available:  pdf(704.30 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Single-language runtime systems, in the form of Java virtual machines, are widely deployed platforms for executing untrusted mobile code. These runtimes provide some of the features that operating systems provide: interapplication memory protection and basic system services. They do not, however, provide the ability to isolate applications from each other. Neither do they provide the ability to limit the resource consumption of applications. Consequently, the performance of current systems degra ...

**Keywords:** Robustness, garbage collection, isolation, language runtimes, resource management, termination, virtual machines



17 Reactive provisioning of backend databases in shared dynamic content server clusters

-  Gokul Soundararajan, Cristiana Amza  
December 2006 **ACM Transactions on Autonomous and Adaptive Systems (TAAS)**, Volume 1 Issue 2  
**Publisher:** ACM Press  
Full text available:  pdf(928.76 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This paper introduces a self-configuring architecture for on-demand resource allocation to applications in a shared database cluster. We use a unified approach to load and fault management based on data replication and reactive replica provisioning. While data replication provides scaling and high availability, reactive provisioning dynamically allocates additional replicas to applications in response to peak loads or failure conditions, thus providing per application performance. We design an e ...

**Keywords:** Autonomic systems, databases, query processing, transactions

18 Performance of database workloads on shared-memory systems with out-of-order processors

-  Parthasarathy Ranganathan, Kourosh Gharachorloo, Sarita V. Adve, Luiz André Barroso  
October 1998 **ACM SIGPLAN Notices , ACM SIGOPS Operating Systems Review , Proceedings of the eighth international conference on Architectural support for programming languages and operating systems ASPLOS-VIII**, Volume 33 , 32 Issue 11 , 5  
**Publisher:** ACM Press  
Full text available:  pdf(1.62 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Database applications such as online transaction processing (OLTP) and decision support

systems (DSS) constitute the largest and fastest-growing segment of the market for multiprocessor servers. However, most current system designs have been optimized to perform well on scientific and engineering workloads. Given the radically different behavior of database workloads (especially OLTP), it is important to re-evaluate key system design decisions in the context of this important class of applicatio ...

## 19 Parallel query processing in shared disk database systems



Erhard Rahm

December 1993 **ACM SIGMOD Record**, Volume 22 Issue 4

**Publisher:** ACM Press

Full text available: pdf(715.43 KB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

System developments and research on parallel query processing have concentrated either on "Shared Everything" or "Shared Nothing" architectures so far. While there are several commercial DBMS based on the "Shared Disk" alternative, this architecture has received very little attention with respect to parallel query processing. A comparison between Shared Disk and Shared Nothing reveals many potential benefits for Shared Disk with respect to parallel query ...

## 20 B-tree concurrency control and recovery in page-server database systems



Ibrahim Jaluta, Seppo Sippu, Eljas Soisalon-Soininen

March 2006 **ACM Transactions on Database Systems (TODS)**, Volume 31 Issue 1

**Publisher:** ACM Press

Full text available: pdf(401.86 KB) Additional Information: [full citation](#), [appendices and supplements](#), [abstract](#), [references](#), [index terms](#)

We develop new algorithms for the management of transactions in a page-shipping client-server database system in which the physical database is organized as a sparse B-tree index. Our starvation-free fine-grained locking protocol combines adaptive callbacks with key-range locking and guarantees repeatable-read-level isolation (i.e., serializability) for transactions containing any number of record insertions, record deletions, and key-range scans. Partial and total rollbacks of client transactio ...

**Keywords:** ARIES, ARIES/CSA, B-tree, cache consistency, callback locking, client-server database system, data shipping, key-range locking, page server, partial rollback, physiological logging, sparse B-tree, structure modification

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## Cache consistency and concurrency control in a client/server DBMS architecture

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## ↑ INDEX TERMS

### Primary Classification:

H. Information Systems

↳ H.2 DATABASE MANAGEMENT

↳ H.2.4 Systems

↳ **Subjects:** Concurrency

### Additional Classification:

H. Information Systems

↳ H.2 DATABASE MANAGEMENT

↳ H.2.2 Physical Design

↳ **Subjects:** Deadlock avoidance

↳ H.2.4 Systems

↳ **Subjects:** Distributed databases

### General Terms:

Algorithms, Experimentation, Performance

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↑ **This Article has also been published in:**

- **ACM SIGMOD Record**  
Volume 20, Issue 2 June 1991

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